

Banknote Counter

CAT520UV

USER MANUAL

2010 Edition

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1. OVERALL DESCRIPTIONS

1-1. Names and Functions of Parts

■ Front View



① **Hopper**

Place notes on it to count.

② **Auxiliary Hopper Plates**

Used for leading the notes to the feeding mechanism.

③ **Keys**

Refer to page 5 for description of each key.

④ **Display**

The Display shows all the messages.

⑤ **Stacker**

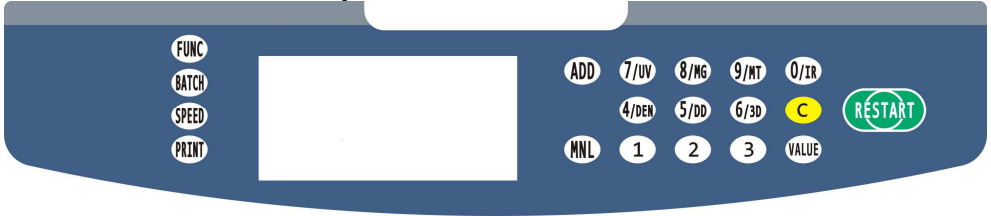
The counted notes are stacked onto the Stacker.

■ Rear View



- ⑥ **Thickness Adjustment Knob**
Used to adjust the Feed Gap to make the counting smooth. Widen the Feed Gap by turning the Knob towards “+” sign, or narrow the Feed Gap towards “-” sign.
- ⑦ **Carrying Handle**
Used for carrying the machine.
- ⑧ **Power Switch**
Used to turn on or off the machine.
- ⑨ **Power Inlet**
Used to connect the Power Cable.
- ⑩ **RS232 Interface**
Used to connect the machine to Printer / External Display / PC.

1-2. Overview of Keys (keys and functions are subject to models and machines)



FUNC

Enter/Exit from the function setting mode(FUN mode). When the machine is in the FUN mode, “FUN” is shown on the display.

BATCH

Press it continuously to select the preset batch number (0→5→10→20→50→100).

SPEED

Select counting speed (Fast, Normal, Slow).

PRINT

Print the counted result.

In FUN mode, press PRINT key to switch among Printer, External Display, PC and print paper width settings.

ADD

Adding function On/Off.

In FUN mode, press ADD key continuously to select the counting mode.

In external equipment settings, press ADD key to switch on/off or print paper width.

MNL

Select Automatic start or Manual start.

7/UV

In FUN mode, press this key to set the Fluorescence Detection On(level)/Off.

8/MG

In FUN mode, press this key to set the Magnetism Detection On(level)/Off.

9/MT

In FUN mode, press this key to set the Metal Thread Detection On(level)/Off.

0/IR

In FUN mode, press this key to set the Infrared Marks Detection On(level)/Off.

4/DEN

In FUN mode, press this key to set the Density Detection On(level)/Off.

5/DD

In FUN mode, press this key to set the Width Detection On(level)/Off.

6/3D

In FUN mode, press this key to set the Length Detection On(level)/Off.

C

Clear error message, counted result, batch number, etc.

VALUE

Check the total sheets of the counted notes and details of each denomination.

RESTART

Used to initiate a counting operation or clear an error message.

0



9

To set the batch number with 0-9 keys.

2. OPERATION PROCEDURES

2-1. Operation

Step 1. Turn on the Power Switch.



ON



OFF

Step 2. Select SHEETS COUNTING mode , VALUE COUNTING mode , or SORTING mode by pressing ADD key in FUN mode.

Step 3. Set batch number by pressing 0-9 keys or BATCH key if needed.

Step 4. Set Counting Speed, Auto or Manual Start function, ADD function, [FUN mode] DEN, UV, MG, MT, and IR functions if necessary.

Step 5. Load the aligned banknotes onto the Hopper and set the right position to the Auxiliary Plates.
Then press **RESTART** key to start counting if necessary.

2-2. Placing Notes

1. Fan each group of notes before counting, remove foreign matter attached to or inserted between the notes, and remove the torn, wet, soiled, very soft notes.

2. To assure the machine normal working, align four corners and edges of all notes before placing onto the middle of the Hopper.

3. If notes with different sizes are mixed, putting large notes underneath and small notes on top will be good for the counting.



RIGHT



WRONG

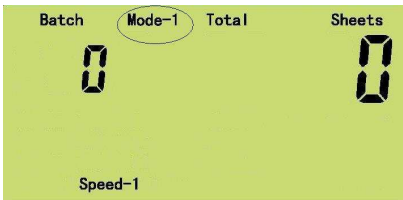
3. MODES AND FUNCTIONS

3-1. Modes

- Mode-1** **SHEETS COUNTING** mode, a default mode, the machine will count the notes in sheets result.
- Mode-11** **VALUE COUNTING** mode (optional), the machine will count the notes in total value result, and the details of every denomination can be checked by pressing VALUE key.
- (Blank)** **SORTING** mode (optional), the machine will record the first note's denomination, count notes of that denomination in total value result, and stop at notes of other denomination which are not counted in the counted result. The selected denomination notes' sheets result can be checked by pressing VALUE key.
(For some models, the machine can use keys to choose a target denomination to sort.)

ADD

In FUN mode, press **ADD** key to change among “**Mode-1**”, “**Mode-11**” and **(Blank)** , the selected mode is shown on the display as below:

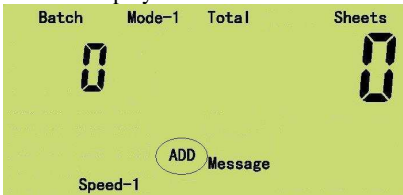


3-2. Functions

■ ADD Function

ADD

Press **ADD** key to turn on or off this function when machine is not in FUN mode. **ADD** will be shown on display when it's on.



ADD function is available in all modes. Every time the machine completes counting, the counted result will be added to the previous one, and the display will show accumulated result. Press **C** Key to clear the accumulated result.

■ **Auto Start and Manual Start Functions**

MNL

Auto Start and Manual Start can be chosen by pressing MNL key.

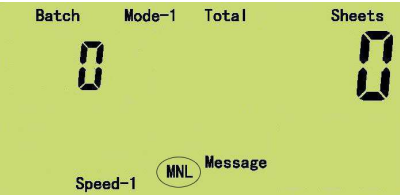
● **Auto Start**

Counting starts automatically after loading notes onto the Hopper.

● **Manual Start**

Start counting by pressing **RESTART** key.

When “MNL” is shown on the display, the **Manual Start** function is activated. When MNL is not shown on the display, the **Auto Start** function is selected.

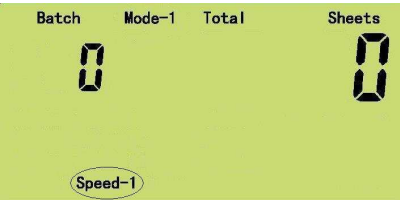


■ **Counting Speed Function**

SPEED

An appropriate speed can be chosen by pressing this key, changeable in three levels (Slow, Normal, Fast):

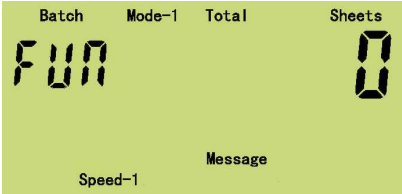
SPEED-1	750 notes/min. (Slow)
SPEED-11 (default)	1000 notes/min. (Normal)
SPEED-111	1500 notes/min. (Fast)



■ FUN Mode

FUNC

To enter the function setting mode (FUN mode), press FUNC key and “FUN” will be shown on the display. To exit, press FUNC key again or any other non-composite key, or machine runs, “FUN” will disappear from the display.



■ Double Feeding Detection Function

4/DEN

Machine detects Double Feeding by **DEN** function. The detection level can be selected depending on the density of the notes.

Four different levels can be chosen by pressing **4/DEN** key continuously in FUN mode.

DEN-1 → DEN-11 → DEN-111 → DEN-1111

DEN-1	Level 1: To count dark-colored (thick) notes.
DEN-11	Level 2: To count high density notes.
DEN-111	Level 3: To count median density notes.
DEN-1111	Level 4: To count light-colored (thin) notes.
OFF(Blank)	When counting very dark-colored notes or very thick notes, this function should be turned off. But machine can not detect Double Feeding.



■ UV Detection Function (Optional)

7/UV

UVD function is to detect the fluorescence on notes. A counterfeit note that generates fluorescence under the ultraviolet rays can be detected when this function is set ON. The machine will stop, showing message “CF1” . The suspected note is the last one in the Stacker. Take the suspected note away and press **RESTART** key to continue the counting. The suspected one isn’t included in the counted result. Four sensitivity levels can be selected by pressing 7/UV key in FUN mode.

UVD-1 → UVD-11 → UVD-111 → UVD-1111

UVD-1	Level 1: To count notes of the lowest UV sensitivity level
UVD-11	Level 2: To count notes of middle UV sensitivity level
UVD-111	Level 3: To count notes of high UV sensitivity level
UVD-1111	Level 4: To count notes of the highest UV sensitivity level
OFF(Blank)	Function inactive.

■ MG Detection Function (Optional)

8/MG

This function is to detect the magnetism on notes. Through this function, machine can detect counterfeit notes without magnetism. When a counterfeit note is detected, the machine will stop and show the error message “CF2”. The suspected note is the last one in the Stacker. Take the suspected one away and press **RESTART** key to continue the counting. The suspected one isn’t included in the counted result. Four sensitivity levels can be selected by pressing 8/MG key in FUN mode.

MGD-1 → MGD-11 → MGD-111 → MGD-1111 → (Blank)

MGD-1	Level 1: To count notes of the lowest magnetic sensitivity level
MGD-11	Level 2: To count notes of middle magnetic sensitivity level
MGD-111	Level 3: To count notes of high magnetic sensitivity level
MGD-1111	Level 4: To count notes of the highest magnetic sensitivity level
OFF(Blank)	The function should be turned off when counting notes without magnetism.

■ MT Detection Function (Optional)

9/MT

This function is to detect the metal thread of the banknotes. Through this function, the machine can detect counterfeit notes without a metal thread. When a counterfeit note is detected, the machine will stop, showing the error message “CF3” on the display. The suspected note is the last one in the Stacker. Take the suspected one away and press **RESTART** key to continue the counting. The suspected one isn’t included in the counted result.

Four sensitivity levels can be selected by pressing 9/MT key in FUN mode.

MTD-1→MTD-11→MTD-111→MTD-1111→(Blank)

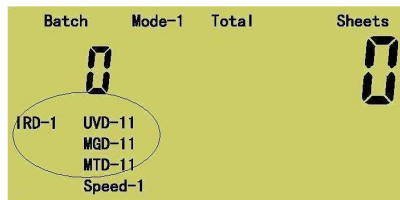
MTD-1	Level 1:To count notes of the lowest sensitivity level
MTD-11	Level 2:To count notes of middle sensitivity level
MTD-111	Level 3:To count notes of high sensitivity level
MTD-1111	Level 4:To count notes of the highest sensitivity level
OFF(Blank)	The function should be off when counting notes without a metal thread.

■ IR Detection Function (Optional)

0/IR

This function is to detect the infrared mark on notes. Through this function, the machine can detect counterfeit notes without the infrared mark. When a counterfeit note is detected, the machine will stop, showing the error message “**CF4**” on the display. The suspected note is the last one in the stacker. Take the suspected one away and press **RESTART** key to continue the counting. The suspected one isn’t included in the counted result.

In FUN mode, press **0/IR** key to enter this function and “**IRD-1**” will be shown on the display.



■ DD Function (Optional)

5/DD

Through this function, the width of the first counted note will be memorized so that wider or narrower notes can be detected, and the machine will stop and the message “**dd**” will be shown on the display.

Four sensitivity levels are selectable by pressing **5/DD** key in FUN mode.

DD-1	Level 1: 6 mm sensitivity level.
DD-11	Level 2: 5 mm sensitivity level.
DD-111	Level 3: 4 mm sensitivity level.
DD-1111	Level 4: 3 mm sensitivity level.
Blank	The function is off.

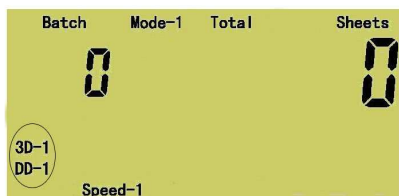
■ 3D Function (Optional)

6/3D

Through this function, the length of the first counted note will be memorized so that longer or shorter notes can be detected, and the machine will stop and the message “3d” will be shown on the display.

Four sensitivity levels are selectable by pressing **6/3D** key in FUN mode.

3D-1	Level 1: 6 mm sensitivity level
3D-11	Level 2: 5 mm sensitivity level
3D-111	Level 3: 4 mm sensitivity level
3D-1111	Level 3: 3 mm sensitivity level
Blank	The function is off.



3-3. RS232 Interface

Turn off the machine, and connect it to Printer, External Display or PC with suitable cable through RS232 interface. Then turn on the machine and set the external equipment setting as below:

PRINT

In FUN mode, press **PRINT** key to switch to the external equipment setting you want.

Switch Sequence:

PPP (Printer)→EEE (External Display)→CCC (PC)→PRP (Print Paper Width)

Then press ADD key to switch on/off or print paper width. And press **RESTART** key to confirm the operation.

4. DEFAULT SETTINGS IN FACTORY

- Turn the Power Switch on, the machine will be in the previous setting.
- Turn on the Power Switch while pressing the **RESTART** key for 2 seconds, and the machine will be in the default settings.

The default settings in factory are as follow:

Function	Settings	Descriptions
DEN	DEN-1	Level 1: To count dark-colored (thick) notes.
DD	OFF	DD function is off.
3D	OFF	3D function is off.
UVD	UVD-11	Level 2: To count notes of middle UV sensitivity.
MGD	MGD-11	Level 2: To count notes of middle MG sensitivity.
MTD	MTD-11	Level 2: To count notes of middle MT sensitivity.
IRD	OFF	Infrared detection is off.
ADD	OFF	ADD function is off.
MODE	Mode-1	Sheets counting mode
SPEED	Speed-11	1000 notes/min
MNL	OFF	Auto Start is on.
Batch	100	100 sheets

5. SPECIFICATIONS

Ambient Temperature	5 ~ 40℃
Ambient Humidity	20 ~ 80%
Feeding System	Roller Friction System
Hopper Capacity	400 notes
Stacker Capacity	200 notes
Size of Countable Note	50×90 ~ 110×185(mm)
Thickness of Countable Note	0.075 ~ 0.15(mm)
Batch Number Displayed	Three Digits (LCD)
Counting Number Displayed	Seven Digits (LCD)
Message Displayed	Three Digits (LCD)
Power Source	AC100 ~ 240V, 50 ~ 60Hz
Power Consumption	≤55W
Dimensions	272mm×235mm×239mm
Weight	5.5 ~ 6.0Kg
Width detection sensitivity	3 ~ 6 mm
Length detection sensitivity	3 ~ 6 mm
Counting Speed	Speed-1 750 notes/min Speed-11 1000 notes/min Speed-111 1500 notes/min

6. ADJUSTMENT OF THE FEED GAP

- The correct Feed Gap is vitally important to the smooth functioning of the machine. After a long-term usage, the rubber components of both the Feed Roller and the Friction Roller may be subject to natural wear. Under this condition, the Feed Gap may become too wide and, as a result, Error Codes will be generated and note feeding will become erratic.
- To check and adjust the Feed Gap to counteract this simple wear condition, please follow the 3 steps below, in conjunction with the photograph:
 1. Manually insert a genuine banknote into the Feed Gap and move it back and forth. If you don't feel any resistance, it indicates the gap is too wide; if the resistance is very strong, it indicates the gap is too narrow.
 2. If the Feed Gap is found to be too wide, please adjust the Thickness Knob counter-clockwise to reduce the Feed Gap until the proper slipping-resistance is achieved with your banknote.
 3. If the Feed Gap is found to be too narrow, please adjust the Thickness Knob clockwise to increase the Feed Gap until the proper slipping-resistance is achieved with your banknote.



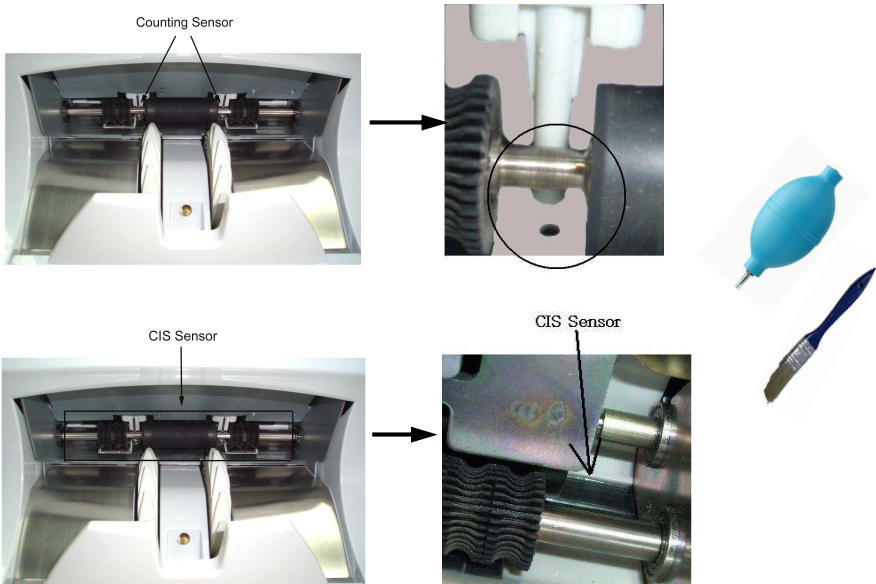
7. DAILY CARE

Clean the following Sensors with a brush/Money Counter cleaning card/air blow ball periodically depending on the frequency of usage. Recommended cleaning is once a week for low usage machines, more frequently for higher usage machines.

- Hopper Sensor and Stacker Sensor



- Counting Sensors & CIS Sensor



8. ERRORS AND REMEDIAL MEASURES

When an error occurs during counting, the LCD Display will flash the error code. Clear the error in accordance with the following procedures.

Error Code	Cause of Error	Remedial Measures
EA	Hopper Sensor is covered.	Remove what is covering the Hopper Sensor.
E1	1, One or both of the Counting Sensors are damaged if E1 appears when power on . 2, Counting Sensors are dirty. 3, Notes are jammed in the roller.	1, Replace the damaged Counting Sensor. 2, Clean Counting sensors. (Refer to Chapter 7) 3, Take away jammed note(s) with hand. When there is a difficulty in taking away jammed notes, turn Drum Rollers by hand.
E2	1, Notes on Stacker when power on . 2, Stacker Sensor is dirty. 3, Stacker Sensor is damaged.	1, Remove the notes placed on the Stacker. 2, Clean Stacker Sensor with the brush. (Refer to Chapter 7) 3, Replace the damaged Stacker Sensor.
E3	1, Hopper Sensor is covered when power on . 2, Hopper Sensor is dirty. 3, Hopper Sensor is damaged.	1, Remove what is covering the Hopper Sensor. 2, Clean the Hopper Sensor with the brush. (Refer to Chapter 7) 3, Replace the damaged Hopper Sensor.
E4	Communication of CIS Sensor is wrong.	Check the CIS communication.
EH	1, Half-sized note is fed. 2, A small note passes from the left or right side. 3, DEN Function is not adjusted right. 4, One of the Counting Sensors is damaged.	1, Take away the half-sized note. 2, Let the note pass in the middle. 3, Adjust the DEN Function according to DEN ADJUSTMENT in Chapter 6 of the service manual. 4, Replace the damaged Counting Sensor.
Ec	More than two notes are fed in chain.	If this error happens very often, the Feed Gap might be too wide. Please adjust the size of the gap. (Refer to Chapter 6)
Ed	Two notes are fed at a time or a dirty note is fed.	If this error happens very often, please adjust the DEN Function. (Refer to Chapter 6 of the service manual)
dd	A note of a different width from the first note.	1, Take out the last note from the Stacker. 2, Check the denomination and width of the note. 3, Press RESTART key to continue the counting.
3d	A note of a different length from the first note.	1, Take out the last note from the Stacker. 2, Check the denomination and length of the note. 3, Press RESTART key to continue the counting.
CF1	Suspected counterfeit note is detected by UV detection.	1, Take away the last note from the Stacker and make sure that it is the same note as the others. 2, Press RESTART key. 3, Recount the last note taken away from the Stacker.
CF2	Suspected counterfeit note is detected by MG detection.	1, Take away the last note from the Stacker and make sure that it is the same note as the others. 2, Press RESTART key. 3, Recount the last note taken away from the Stacker.
CF3	Suspected counterfeit note is detected by MT detection.	1, Take away the last note from the Stacker and make sure that it is the same note as the others. 2, Press RESTART key. 3, Recount the last note taken away from the Stacker.
CF4	Suspected counterfeit note is detected by IR detection.	1, Take away the last note from the Stacker and make sure that it is the same note as the others. 2, Press RESTART key. 3, Recount the last note taken away from the Stacker.
EID	Machine can't read the value of the note.	1, Take away the last note from the Stacker and make sure that it is the same note as the others. 2, Press RESTART key. 3, Recount the last note taken away from the Stacker.

9. ACCESSORIES & OPTIONS

9-1 Accessories

1. Power Cable.....1
2. Instruction Manual.....1
3. Brush.....1

9-2 Options

(Refer to Page 12, “3-3 RS232 Interface” for operation)

1. External Display

An option of External Display is available, which will show the counting results synchronously when connected to the RS232 interface of the banknote counter.

2. NCC Driver and RS232 Serial Cable

This option is for connecting the banknote counter to a computer.

- 1) Install the NOTE COUNTER CONTROLLER (NCC) Driver in the computer.
- 2) Connect the banknote counter to computer through RS232 interface.
- 3) Turn on the banknote counter and then run the NCC.EXE.
- 4) The counting results will be displayed on the computer, and can be stored in an excel format file.

3. Printer

The note counter can connect with a printer, which uses Epson “ESC” Command System, by the RS232 interface to print out the counting result.